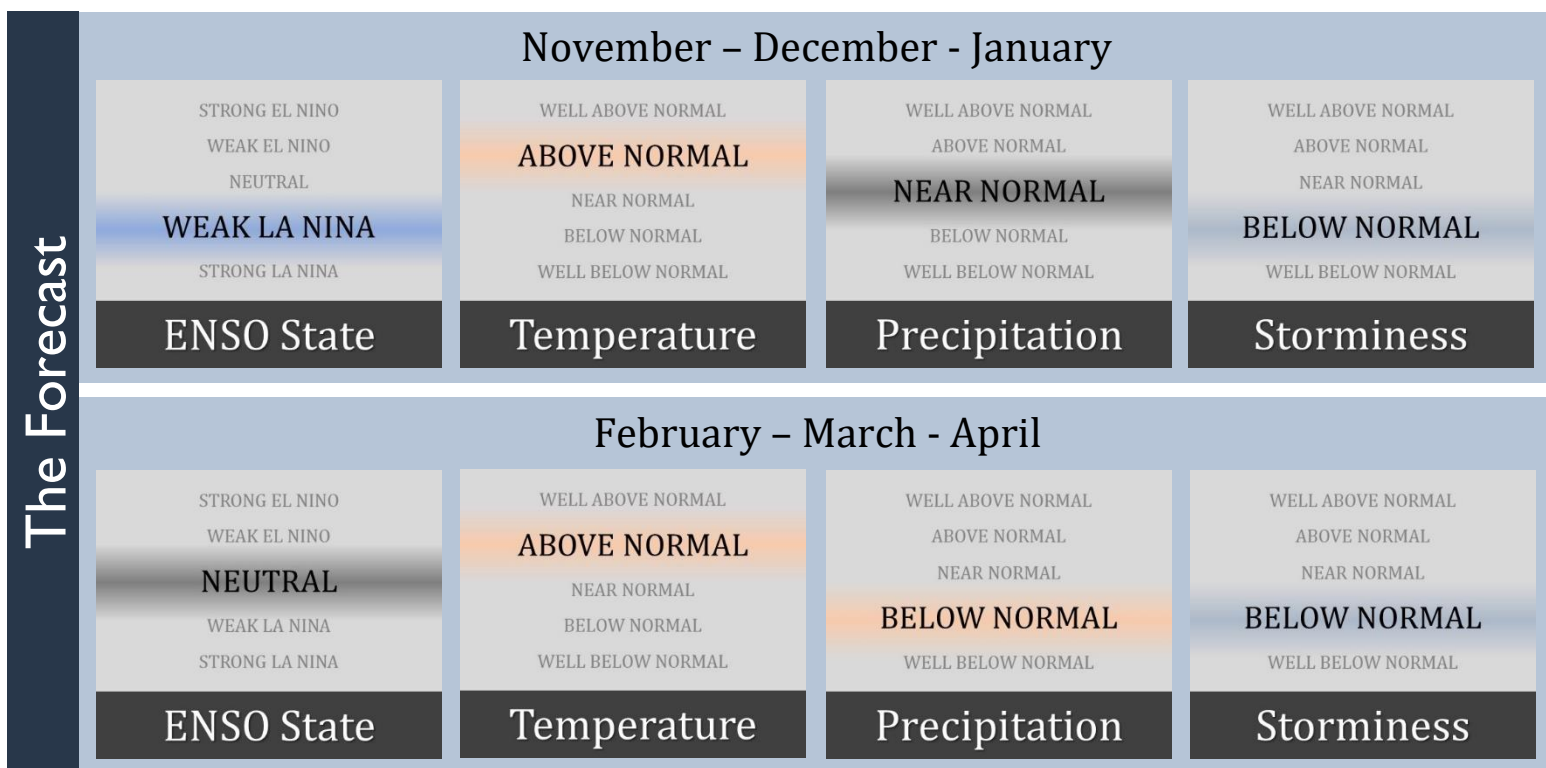


National Weather Service Melbourne

DRY SEASON FORECAST

Nov
2022



Forecast Overview | November 2022

- La Niña conditions continue and are expected to persist over the equatorial Pacific Ocean through at least the winter (Dec-Feb), with a transition to ENSO neutral conditions into the latter half of the dry season (Feb-Apr).
- La Niña conditions will likely weaken through the winter, and even with the expected transition to ENSO neutral, lingering La Niña impacts are forecast across central Florida through the end of the dry season.
- While a wet November may actually lead to near normal rainfall for the first half of the dry season, the overall precipitation outlook for the rest of the dry season (Dec-Apr) across central Florida, favors below normal rainfall, which may lead to drought development and an increase in wildfire activity into late winter and spring.
- While ENSO state typically has a weaker influence on temperature patterns across Florida, recent trends combined with the influence of La Niña, favors above average temperatures persisting this dry season. However, periods of cooler than normal weather will likely still occur, with freezing temperatures also possible.
- Seasonal storminess is forecast to remain below normal, but individual storm systems can still bring an increased risk of hazardous weather, including severe thunderstorms and tornadoes.

About this Product

This forecast product is a result of research from the National Weather Service (NWS) in Melbourne, Florida on the El Niño - Southern Oscillation (ENSO) and its impact on Central Florida's dry season (November – April). This research, conducted since early 1997, was produced in recognition of the fact that climatic fluctuations on regional and global scales have been shown to have a profound impact on Florida's weather from season to season. The importance of seasonal forecasting continues to increase as extreme weather events affect more of Florida's growing population. These forecasts are meant to supplement, not replace, the official NWS Climate Prediction Center's (CPC) seasonal and winter outlooks by providing more detail and adaptive meteorological interpretation of the impact of predicted climatic events on Central Florida.

Forecast Basis & Interpretation

The seasonal forecast is produced by a team of National Weather Service Melbourne meteorologists that employ the use of linear and logistic regression equations as well as analog-based techniques. These methods are based on the official observed and forecast Niño 3.4 and 3.0 values from the Climate Prediction Center and historical weather data for the Central Florida region. The accuracy of these indices will have a bearing on the accuracy of the seasonal forecast.

The Florida dry season forecast is issued for the period between November 1, 2022 and April 30, 2023 and is intended to serve as an early warning of significant impacts from climatic variability for planners and decision makers. Seasonal temperature and precipitation for Central Florida (climate divisions 3 and 4 as shown in figure 1), as well as the number of extratropical storms expected to impact the state are forecast into two separate periods: November-December-January (NDJ) and February-March-April (FMA).

The ENSO state and forecasts for storminess, rainfall, and temperature are divided into five categories, or quintiles: well below normal, below normal, normal, above normal, and well above normal. Discussions for each individual forecast parameter are included on the next several pages to help address uncertainty and should be used to supplement the forecast charts.



Fig 1. Temperature and precipitation forecasts are provided for Division 3 and 4 (Central Florida) while storminess forecasts are for the entire state of Florida.

ENSO

Latest Discussion | The latest El Niño/Southern Oscillation (ENSO) diagnostic discussion from the Climate Prediction Center states that La Niña conditions continue over the equatorial Pacific waters and are currently moderate in strength. La Niña conditions are expected to persist, but gradually weaken through the Northern Hemisphere winter 2022-2023 (fig. 1b), with a transition to ENSO-neutral toward the February to April time frame.

The latest 3-month (August through October 2022) running mean of sea surface temperature (SST) departures in the Niño 3.4 region, or ONI, was -1.0°C . As of November 21st, the latest weekly SST departure in the Niño 3.4 region was -0.8°C . The most recent forecasts of statistical and dynamical models (fig. 1a) collectively show SSTs departures in the Niño 3.4 region staying cooler than normal (between -0.5 to -1.3°C) through the winter of 2022-2023, with La Niña conditions then transitioning back to ENSO-neutral into the spring of 2023.

Additional Information | The El Niño Southern Oscillation or ENSO is a complex meteorological phenomenon that relates to changes in sea surface temperature and sea level pressure over the equatorial regions of the Pacific Ocean. ENSO has a warm phase (El Niño) and a cool phase (La Niña) and has profound influences on the atmospheric circulations over the Pacific Ocean, and consequently, the circulations over North America and other parts of the globe. Locally, research shows that there is a physical relationship between the state of ENSO and the mean position of the jet stream over North America during the winter and spring seasons. These shifts in the jet stream often influence central Florida in the form of increased/decreased rainfall, storminess, and seasonal temperatures depending on the state of ENSO.

The relationship between Florida weather and ENSO is not just a simple “one-to-one” relationship, however, as other weather patterns (teleconnections) including the North Atlantic Oscillation (NAO), Arctic Oscillation (AO), Pacific-North American teleconnection pattern (PNA) and Madden-Julian Oscillation (MJO) can also play a major role in Florida dry season weather. Even when El Niño/La Niña conditions are occurring over the equatorial pacific, these other teleconnections can act to enhance or suppress the impact of ENSO, or cause extreme variability on their own. Considerable uncertainty remains in longer range outlooks since these other oscillations are generally not predictable beyond 10 – 14 days.

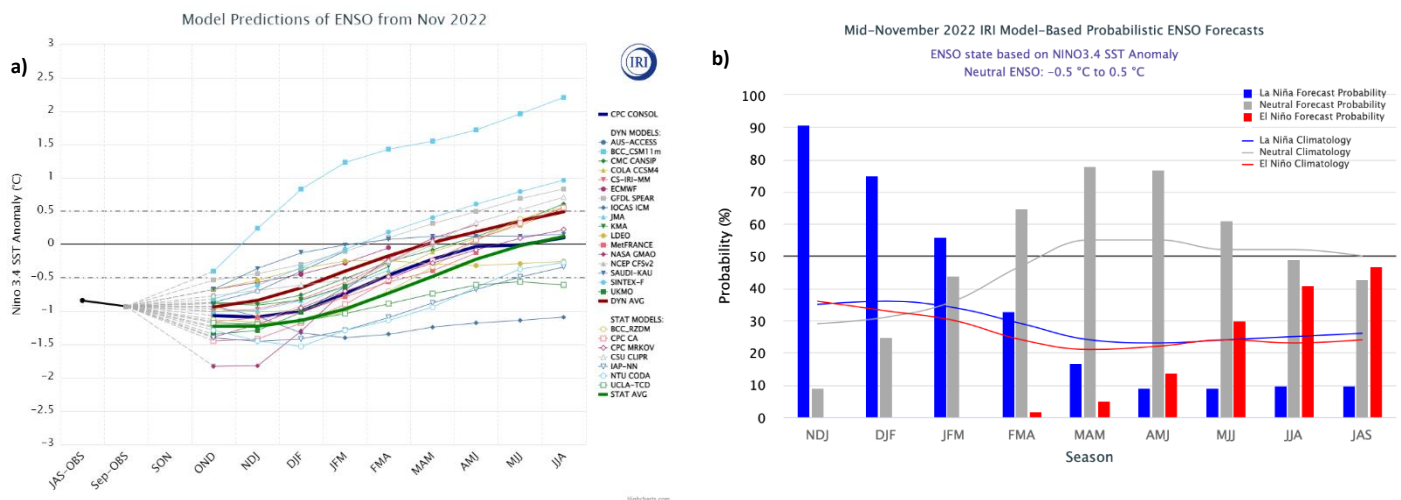


Fig 1. ENSO guidance from the International Research Institute (IRI) for Climate and Society and the Climate Prediction Center (CPC). (a) Dynamical and statistical model plume of ENSO predictions. (b) ENSO forecast probabilities based off of a consensus between IRI and CPC forecasts.

Temperature

Discussion | The forecast for the 2022-2023 dry season (November-April) favors above normal temperatures across Central Florida, based on guidance from CPC (fig. 3) and the development of La Niña conditions that will persist through at least the winter.

Local research suggests a smaller “warm” signal for the first half of the season (November through January), with greater chances of above normal temperatures occurring from February through April. While temperatures over both three-month periods are forecast to trend above normal, significant week-to-week and month-to-month variation is expected as other large-scale weather patterns typically overpower the influence of weak La Nina events. It is important to remember that confidence in temperature forecasts for the dry season in Florida is typically lower compared to other seasonal forecast parameters (rainfall and storminess) when compared to ENSO state.

Hard freezes across Central Florida are most common in the months of December and January. Freezing conditions can occur during all ENSO states (table 1), and examination of analog years with weak La Niña conditions indicate the majority experienced freezes at some point during the winter months. Again, other shorter-term teleconnection patterns like the NAO and AO will dictate the timing of any threat of a dry season freeze event.

Additional Information | When trying to correlate the state of ENSO and seasonal temperature over Central Florida, one finds much less skill compared to precipitation and storminess. Other large-scale phenomena, including the North Atlantic Oscillation (NAO) and Arctic Oscillation (AO), play a significant role in the week-to-week weather patterns over the state. For instance, strongly negative (positive) phases of the AO often lead to colder (warmer) than normal weather across the eastern half of the United States, including Florida. The AO is not predictable beyond a few weeks, and there are no long-range outlooks available at this time.

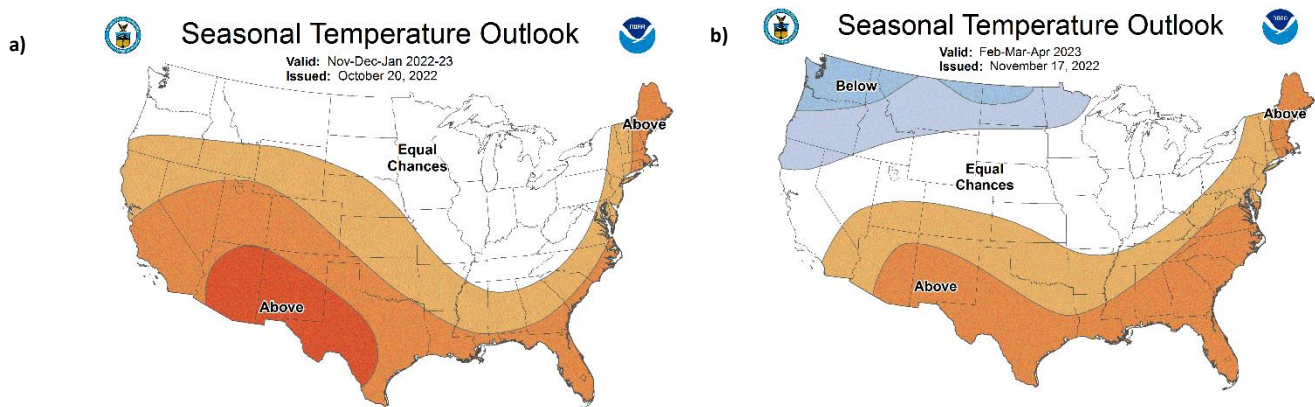


Fig 3. Three-month temperature probability outlooks issued by the Climate Prediction Center (CPC). Temperature probabilities for (a) Nov-Dec-Jan and (b) Feb-Mar-Apr.

ENSO State	Daytona Beach		Orlando		Melbourne		Vero Beach		ENSO State
	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	
El Niño	4.4	0.9	2.2	0.6	1.9	0.4	1.6	0.2	El Niño
Neutral	4.5	1.0	2.0	0.5	2.1	0.5	1.8	0.4	Neutral
La Niña	6.1	1.2	3.3	0.5	2.6	0.4	2.4	0.4	La Niña

Table 1. Average number of days during the dry season when the minimum temperature reaches at or below freezing based on ENSO state using data from 1950 to 2010. A hard freeze is when minimum temperatures reached 28°F or lower.

Precipitation

Discussion | The overall forecast for the 2022-2023 dry season (November-April) favors below normal precipitation across Central Florida, based on guidance from CPC (fig. 4) and the development of La Niña conditions that will persist through at least the winter. Rainfall has actually been above normal across central Florida in November, largely due to Hurricane Nicole, which may in turn lead to near normal rainfall for the first half of the dry season. However, this will largely be skewed toward November, with drier than normal conditions then favored to prevail for the remainder of the dry season months (December through April), as the hurricane season is ending, and the influence of La Nina on weather patterns across Florida typically increases.

Local research shows that ENSO state has a greater correlation with precipitation patterns across the area, especially the stronger an El Niño or La Niña event becomes. While this La Niña is likely to be mostly weak, logistic regression and analog-based techniques still support greater chances of drier than normal conditions occurring throughout the entire dry season. However, the potential of large-scale weather patterns disrupting the influence of ENSO does increase with weaker events, leading to a little more uncertainty in the forecast. The outlook of below normal precipitation will increase the threat of developing drought conditions and also wildfire potential across the area, especially into the second half of the dry season (February-April). Areas southeast of the I-4 corridor that did not receive as much rainfall from Ian or Nicole will likely be the most vulnerable initially for drought and wildfire impacts as we get into the latter half of the dry season.

Additional Information | The relationship between ENSO and rainfall is perhaps the most straightforward and statistically significant of all weather parameters. In general, during the Florida dry season, substantial rainfall is only provided by passing extratropical disturbances in the westerlies or by stalled frontal boundaries. During an El Niño event, the number of extratropical systems is often increased over Florida and the Gulf of Mexico leading to above average rainfall. Likewise, during a La Niña event, rainfall is often lower than normal due to a limited number of extratropical systems impacting the state.

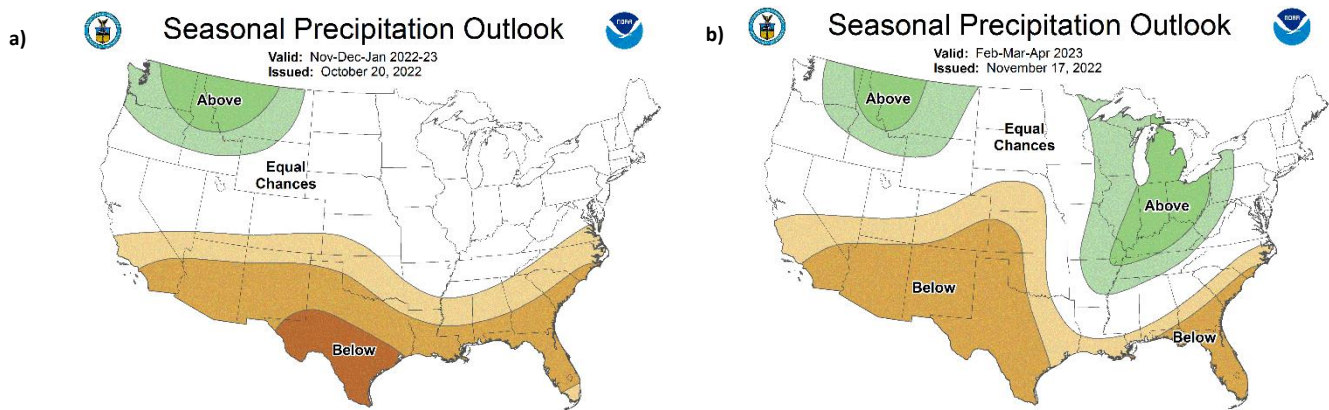


Fig 4. Precipitation probability outlooks issued by the Climate Prediction Center (CPC). Precipitation probabilities for (a) Nov-Dec-Jan and (b) Feb-Mar-Apr.

Storminess

Discussion | The forecast for the 2022-2023 dry season (November-April) is for below average storminess across the state, due to the continuation of La Niña conditions that will persist through at least the winter. However, even during a La Niña pattern, individual storm systems can still occur, bringing an increased threat of hazardous weather, including severe thunderstorms and tornadoes.

Additional Information | This forecast attempts to estimate the number of extratropical low pressure systems that will impact the state during a given dry season. There is a very strong relationship between ENSO and winter storminess and severe weather in Florida. Extratropical cyclones can produce excessive rainfall, severe thunderstorm winds, tornadoes, damaging straight-line winds, dangerous marine conditions, coastal flooding, and beach erosion. The number of extratropical low pressure systems passing near or over the state often increases during El Niño episodes due a southward shift in the position of the jet stream over North America.

Preparedness Advice

While seasonal storminess is forecast to be below normal, individual storm systems can still bring an enhanced risk of hazardous weather, including severe thunderstorms and tornadoes. We've put together some safety information for you and your family to help prepare for when the next storm strikes.

BE AWARE: PREPARE!

- ✓ Monitor local television, radio, and the internet for severe weather situations
 - Severe weather threats are typically identified a few days in advance, with more specific information about the most likely time(s) and location(s) of impact provided one day in advance
- ✓ Have an all-hazards plan in place
 - Every person and/or family should have an all-hazards plan that includes multiple ways to receive severe weather warnings and knowing what to do when one is issued
- ✓ Have multiple dependable ways to receive timely weather warning alerts
 - Ensure that you have a NOAA Weather Radio (programmed, with fresh batteries) and/or the Wireless Emergency Alert feature on your cell phone (or NWS warnings relayed by text message from Emergency Management, Media, or another reliable app)
 - Can save lives, especially with dangerous, nighttime tornadoes

BEFORE / DURING THREAT

- ✓ If living in a mobile home, RV, or boat:
 - Make plans to stay with family or friends and leave before the threat for severe weather arrives
 - If you can't leave, identify the closest sturdy shelter such as a clubhouse or laundry room and go there immediately if a warning is issued for your location
- ✓ Identify your shelter location and "safe place" in advance of a threat
 - Small interior room on the lowest floor of your home or business, far from windows
 - Ensure everyone in your family or business is aware of the location
- ✓ Words of advice from those who have survived tornadoes
 - "Putting on your shoes, placing your charged cell phone in your pocket, making good use of any kind of helmet and/or pillow to protect your head, and holding tightly to one another" (these actions must be done quickly and prior to the arrival of a tornado)
- ✓ If a tornado warning is issued for your location:
 - Take immediate action and move to your shelter, remain in place until the threat passes

Helpful Links

Teleconnection Guidance & Forecasts from the Climate Prediction Center (CPC)

[ENSO](#) | [AO](#) | [NAO](#) | [PNA](#) | [MJO](#)

CPC Guidance (Temperature, Precipitation, Drought, Hazards)

[1-Month Outlook](#) | [3-Month Outlook \(~90 Days\)](#)

[U.S. Drought Information](#) | [U.S. Hazards Assessment](#) (out to 2 weeks)

National Weather Service Melbourne, FL Research

[ENSO and Climate](#) | [Storminess](#) | [Severe Weather](#) | [Rainfall](#) | [Temperature](#)

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